

APPENDIX A

Remedial Alternatives Cost Tables

TABLE A-1

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**ALTERNATIVE #2
EXCAVATION AND DISPOSAL OF ALL COC-IMPACTED SOIL
DEMOLITION AND DISPOSAL OF PCB-IMPACTED CONCRETE**

Former Pechiney Cast Plate, Inc., Facility
Vernon, California

Item No.	Description	Estimated Quantity	Unit	Unit Cost	Estimated Cost
Direct Capital Costs					
1	Mobilization/Demobilization	1	ls	\$ 20,000	\$ 20,000
2	Excavation Shoring	110,500	sqft	\$ 35	\$ 3,867,500
PCBs					
3	Excavate/Load	1,500	cy	\$ 8	\$ 12,000
4a	Transport and Dispose (PCB-Impacted Non-TSCA)	640	ton	\$ 70	\$ 44,800
4b	Transport and Dispose (TSCA >50 mg/kg, < 1000 mg/kg)	1,400	ton	\$ 198	\$ 277,200
4c	Transport and Dispose (TSCA > 1000 mg/kg)	200	ton	\$ 295	\$ 59,000
Metals					
5	Excavate/Stockpile/Load	70	cy	\$ 8	\$ 560
6a	Transport and Dispose - Non-Hazardous	95	ton	\$ 44	\$ 4,180
6b	Transport and Dispose Non-RCRA CA Hazardous	10	ton	\$ 102	\$ 1,020
VOCs and Stoddard Solvent					
7	Excavate/Stockpile/Load	159,200	cy	\$ 8	\$ 1,273,600
8a	Transport and Dispose Non-Hazardous	214,920	ton	\$ 65	\$ 13,969,800
8b	Transport and Dispose RCRA-Hazardous	23,880	ton	\$ 134	\$ 3,199,920
9	Stockpile and Confirmation Sampling	800	ea	\$ 250	\$ 200,000
10	Purchase and Import Fill	50,000	ton	\$ 9	\$ 450,000
11	Place and Compact Fill	40,000	ton	\$ 9.25	\$ 370,000
PCB-Impacted Concrete⁶					
12	Concrete Removal/Crush/Place (PCBs >1.0 mg/kg but <3.5 mg/kg) ⁷	26,220	ft ³	\$ 3	\$ 78,660
13	Concrete Removal/Size/Load (PCBs >3.5 mg/kg but <50 mg/kg)	7,080	ft ³	\$ 4	\$ 28,320
14	Concrete Removal/Size/Load (PCBs >50 mg/kg)	2,020	ft ³	\$ 4	\$ 8,080
15	Stockpile and Confirmation Sampling	35	ea	\$ 250	\$ 8,830
16	Transport and Dispose (PCBs >3.5 mg/kg, but <50 mg/kg)	900	ton	\$ 115	\$ 103,500
17	Transport and Dispose (PCBs >50 mg/kg)	120	ton	\$ 295	\$ 35,400
18	Interim Cap	1	ls	\$ 20,000	\$ 20,000
Other					
19	Air Monitoring	1	ls	\$ 20,000	\$ 20,000
20	Health and Safety	1	ls	\$ 20,000	\$ 20,000
21	Other Non-Scheduled Contract Work	1	ls	\$ 20,000	\$ 20,000
Direct Capital Total					\$ 24,092,000

TABLE A-1

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ALTERNATIVE #2
EXCAVATION AND DISPOSAL OF ALL COC-IMPACTED SOIL
DEMOLITION AND DISPOSAL OF PCB-IMPACTED CONCRETE

Former Pechiney Cast Plate, Inc., Facility
Vernon, California

Indirect Capital Costs				
1	Construction Management	6%	of	\$ 24,092,000
				\$ 1,445,520
				Indirect Capital Subtotal
				\$ 1,446,000
				Direct + Indirect Cost
				\$ 25,538,000
				Bid Contingency (15% estimated contractor costs)
				\$ 3,831,000
				Scope Contingency (15% estimated contractor costs)
				\$ 3,831,000
				Contingencies
				\$ 7,662,000
				Capital Total
				\$ 33,200,000

Notes/Assumptions:

1. Excavation costs include SCAQMD Rule 1166 Monitoring.
2. Excavation shoring cost only includes areas proposed to be excavated at depths of 10 feet bgs or greater.
3. Soil stockpile confirmation sampling rate at one sample per 200 cy; concrete confirmation sampling rate at one sample per 1,000 ft².
4. Excavation and disposal will commence at a rate of 500 cy per day.
5. Backfill to be comprised of crushed recycled aggregate obtained from on-site demolition and crushing of former concrete structures.
Unit cost for placement and compaction also includes crushing. Additional Purchase and Import Fill includes compaction.
6. PCB-Impacted Concrete includes removal and disposal of all concrete impacted with PCBs greater than 1.0 mg/kg.
Demolition and removal costs associated with foundations, footings, pits, sumps, and other subsurface structures are excluded.
7. Concrete Removal/Crush/Place (PCBs >1.0 mg/kg, but <3.5 mg/kg) includes crushing, placement, and compaction.
8. PCB-impacted soil and concrete will be profiled based on TSCA requirements and direct-loaded into waste transport trucks for disposal.
Based on the TSCA requirements, 70% of PCB-impacted soil will be disposed of as TSCA (>50 mg/kg) and 30% as non-TSCA (<50 mg/kg).
9. 90% of Metals-impacted soil excavated will be disposed of as Non-Hazardous.
10% of Metals-impacted soil excavated will be disposed of as RCRA-Hazardous.
10. 90% of VOC-impacted soil excavated will be disposed of as Non-Hazardous.
10% of VOC-impacted soil excavated will be disposed of as RCRA-Hazardous.
11. Soil Conversion Factor: 1.5 tons/cy.
12. Concrete slab removal is based on an average concrete slab thickness of 12 inches.
13. Density of Concrete is 150 lbs/ft³.
14. No cost included for institutional controls such as deed restrictions which will include legal and administrative fees.
15. No cost included for engineering controls such as future vapor barrier requirements.
16. Bid and Scope contingencies derived from "A Guide to Developing and Documenting Remedial Alternative Cost Estimates
During the FS," EPA, 2000.
17. ls = lump sum price.
18. sqft = square feet.
19. cy = cubic yard.
20. ea = each.
21. ft³ = cubic feet.

TABLE A-2

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ALTERNATIVE #3
EXCAVATION AND DISPOSAL OF SHALLOW COC-IMPACTED SOIL
SVE FOR SHALLOW AND DEEP VOC-IMPACTED SOIL
SVE AND BIOVENTING FOR SHALLOW AND DEEP STODDARD SOLVENT-IMPACTED SOIL
DEMOLITION AND DISPOSAL OF PCB-IMPACTED CONCRETE
Former Pechiney Cast Plate, Inc., Facility
Vernon, California

Item No.	Description	Estimated Quantity	Unit	Unit Cost	Estimated Cost
Direct Capital Costs					
1	Mobilization/Demobilization	1	ls	\$ 5,000	\$ 5,000
2	Excavation Shoring	4,300	sqft	\$ 35	\$ 150,500
PCBs					
3	Excavate/Load	1,500	cy	\$ 8	\$ 12,000
4a	Transport and Dispose (PCBs >1 mg/kg, but <50 mg/kg)	640	ton	\$ 70	\$ 44,800
4b	Transport and Dispose (PCBs >50mg/kg, but <1,000 mg/kg)	1,400	ton	\$ 198	\$ 277,200
4c	Transport and Dispose (PCBs >1,000 mg/kg)	200	ton	\$ 295	\$ 59,000
Metals					
5	Excavate/Stockpile/Load	70	cy	\$ 8	\$ 560
6a	Transport and Dispose - Non-Hazardous	95	ton	\$ 44	\$ 4,180
6b	Transport and Dispose - Hazardous	10	ton	\$ 102	\$ 1,020
PCB-Impacted Concrete⁵					
7	Concrete Removal/Crush/Place (PCBs >1.0 mg/kg but <3.5 mg/kg) ⁷	26,220	ft ³	\$ 3	\$ 78,660
8	Concrete Removal/Size/Load (PCBs >3.5 mg/kg but <50 mg/kg)	7,080	ft ³	\$ 4	\$ 28,320
9	Concrete Removal/Size/Load (PCBs >50 mg/kg)	2,020	ft ³	\$ 4	\$ 8,080
10	Stockpile and Confirmation Sampling	35	ea	\$ 250	\$ 8,750
11	Transport and Dispose (PCBs >3.5 mg/kg, but <50 mg/kg)	900	ton	\$ 115	\$ 103,500
12	Transport and Dispose (PCBs >50 mg/kg)	120	ton	\$ 295	\$ 35,400
13	Interim Cap	1	ls	\$ 20,000	\$ 20,000
VOCs SVE					
14	Site Preparation	1	ls	\$ 5,000	\$ 5,000
15	SVE Well and Probe Installation	23	ea	\$ 6,000	\$ 138,000
16	Well Head Completion, Valves, Surface Seal	23	ea	\$ 1,000	\$ 23,000
17	Treatment System Manifold, Valves, Controls	1	ls	\$ 6,000	\$ 6,000
18	Auto-Dialer Control and Instrumentation	1	ls	\$ 5,000	\$ 5,000
19	Vapor-Phase GAC Vessels ¹⁴	1	ls	\$ 18,000	\$ 18,000
20	Electrical Panel/Supply	1	ls	\$ 15,000	\$ 15,000
21	Temporary Hose and Piping	2,000	lf	\$ 10	\$ 20,000
22	Compound Gravel Pad, Fence Installation, Gates	1	ea	\$ 8,000	\$ 8,000
23	Treatment System Installation and Start-Up	1	ls	\$ 20,000	\$ 20,000
24	Laboratory Analysis	1	ls	\$ 10,000	\$ 10,000
25	Health and Safety	1	ls	\$ 10,000	\$ 10,000
26	System Decommission	1	ls	\$ 25,000	\$ 25,000
27	Other Non-Scheduled Contract Work	1	ls	\$ 10,000	\$ 10,000
Stoddard Solvent SVE and Bioventing					
28	Mobilization/Demobilization	1	ls	\$ 10,000	\$ 10,000
29	Site Preparation	1	ls	\$ 5,000	\$ 5,000
30	BioVent Well and Probe Installation	19	ea	\$ 6,000	\$ 114,000
31	Well Head Completion, Valves, Surface Seal	19	ea	\$ 1,000	\$ 19,000
32	Treatment System Manifold, Valves, Controls	1	ls	\$ 6,000	\$ 6,000
33	Auto-Dialer Control and Instrumentation	1	ls	\$ 5,000	\$ 5,000
34	Vapor-Phase GAC Vessels	1	ls	\$ 18,000	\$ 18,000
35	Electrical Panel/Supply	1	ls	\$ 50,000	\$ 50,000
36	Below-Grade Piping	2,250	lf	\$ 15	\$ 33,750
37	Compound Pad, Fence Installation, Gates	1	ea	\$ 8,000	\$ 8,000
38	Treatment System Installation and Start-Up	1	ls	\$ 20,000	\$ 20,000
39	Laboratory Analysis	1	ls	\$ 10,000	\$ 10,000
40	Health and Safety	1	ls	\$ 10,000	\$ 10,000
41	System Decommission	1	ls	\$ 25,000	\$ 25,000
42	Other Non-Scheduled Contract Work	1	ls	\$ 10,000	\$ 10,000
Direct Capital Total					\$ 1,494,000

TABLE A-2

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ALTERNATIVE #3
EXCAVATION AND DISPOSAL OF SHALLOW COC-IMPACTED SOIL
SVE FOR SHALLOW AND DEEP VOC-IMPACTED SOIL
SVE AND BIOVENTING FOR SHALLOW AND DEEP STODDARD SOLVENT-IMPACTED SOIL
DEMOLITION AND DISPOSAL OF PCB-IMPACTED CONCRETE
Former Pechiney Cast Plate, Inc., Facility
Vernon, California

Item No.	Description	Estimated Quantity	Unit	Unit Cost	Estimated Cost
Indirect Capital Costs					
1	Permitting AQMD	5%	of	\$ 313,000	\$ 15,650
2	System Design	10%	of	\$ 656,750	\$ 65,675
3	Construction Management	6%	of	\$ 1,494,000	\$ 89,640
Indirect Capital Subtotal					\$ 171,000
Direct + Indirect Cost					\$ 1,665,000
Bid Contingency (15% estimated contractor costs)					\$ 250,000
Scope Contingency (15% estimated contractor costs)					\$ 250,000
Contingencies					\$ 500,000
Capital Total					\$ 2,165,000
Item No.	Description	Estimated	Unit	Unit Cost	Estimated Cost
VOCs SVE and Stoddard Solvent SVE/Bioventing Annual Operation and Maintenance					
1	Equipment Rental	24	mths	\$ 5,000	\$ 120,000
2	Operations & Maintenance	24	mths	\$ 8,000	\$ 192,000
3	Carbon Changeouts	32	ea	\$ 3,000	\$ 96,000
4	Electrical Fees	24	mths	\$ 2,000	\$ 48,000
5	Sampling & Analysis	24	mths	\$ 2,000	\$ 48,000
6	Production Water Disposal	24	mths	\$ 4,000	\$ 96,000
7	Project Management/Consultant support/Reports	24	mths	\$ 4,000	\$ 96,000
8	Health & Safety/Air Monitoring	24	mths	\$ 1,000	\$ 24,000
9	Miscellaneous	24	mths	\$ 2,000	\$ 48,000
10	DTSC Quarterly Status Report	4	ea	\$ 10,000	\$ 40,000
Annual Operation and Maintenance Subtotal					\$ 808,000
Present Worth Factor (5%, 3 years)					2.72
Present Worth of Operation and Maintenance					\$ 2,200,000
TOTAL CONSTRUCTION PLUS O&M FOR 3 YEARS					\$ 4,400,000

Notes/Assumptions:

- Excavation costs include SCAQMD Rule 1166 Monitoring.
- Excavation shoring cost only includes areas proposed to be excavated at depths of 10 feet bgs or greater.
- Soil stockpile confirmation sampling rate at one sample per 200 cy; concrete confirmation sampling rate at one sample per 1,000 ft².
- Excavation and disposal will commence at a rate of 500 cy per day.
- Backfill to be comprised of crushed recycled aggregate obtained from on-site demolition and crushing of former concrete structures. Unit cost for placement and compaction also includes crushing. Additional Purchase and Import Fill includes compaction.
- PCB-Impacted Concrete includes removal and disposal of all concrete impacted with PCBs greater than 1.0 mg/kg. Demolition and removal costs associated with foundations, footings, pits, sumps, and other subsurface structures are excluded.
- Concrete Removal/Crush/Place (PCBs >1.0 mg/kg, but <3.5 mg/kg) includes crushing, placement, and compaction.
- PCB-impacted soil will be profiled based on TSCA requirements and direct-loaded into waste transport trucks for disposal. Based on the TSCA requirements, 70% of PCB-impacted soil will be disposed of as TSCA (>50 mg/kg) and 30% as non-TSCA (<50 mg/kg).
- 90% of Metals-impacted soil excavated will be disposed of as Non-Hazardous. 10% of Metals-impacted soil excavated will be disposed of as RCRA-Hazardous.
- Soil Conversion Factor: 1.5 tons/cy.
- Concrete slab removal is based on an average concrete slab thickness of 12 inches.
- Assume 1,000 SCFM minimum for SVE system.
- Total system operation costed for a period of one year; for purposes of O&M cost estimation, assume system run time of three years.
- SVE = Soil Vapor Extraction.
- Dual 1,000 pound vapor phase granular activated carbon (GAC) vessels for SVE system.
- AQMD = Southern California Air Quality Management District.
- No cost included for institutional controls such as deed restrictions which will include legal and administrative fees.
- No cost included for engineering controls such as future vapor barrier requirements.
- Bid and Scope contingencies derived from "A Guide to Developing and Documenting Remedial Alternative Cost Estimates During the FS," EPA, 2000.
- Is = lump sum price.
- sqft = square feet.
- cy = cubic yard.
- ea = each.
- If = linear feet.
- mths = months.
- ft³ = cubic feet.

TABLE A-3

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ALTERNATIVE #4
IN SITU STABILIZATION OF SHALLOW PCB/METALS-IMPACTED SOIL AND DEEP STODDARD SOLVENT-IMPACTED SOIL

SVE FOR SHALLOW AND DEEP VOC-IMPACTED SOIL
DEMOLITION AND DISPOISAL OF PCB-IMPACTED CONCRETE

Former Pechiney Cast Plate, Inc., Facility
Vernon, California

Item No.	Description	Estimated Quantity	Unit	Unit Cost	Estimated Cost
Direct Capital Costs					
PCB, Metals, and Stoddard Solvent Stabilization					
1	Mobilization/Demobilization	1	ls	\$ 100,000	\$ 100,000
2	Site Preparation	1	ls	\$ 10,000	\$ 10,000
3	In-Situ Stabilization	48,000	cy	\$ 135	\$ 6,480,000
4	Confirmation Sampling	240	ea	\$ 250	\$ 60,000
5	Air Monitoring	1	ls	\$ 15,000	\$ 15,000
6	Excess Cuttings Disposal	14,400	ton	\$ 70	\$ 1,008,000
7	Health and Safety	1	ls	\$ 10,000	\$ 10,000
8	Other Non-Scheduled Contract Work	1	ls	\$ 50,000	\$ 50,000
PCB-Impacted Concrete ⁶					
9	Concrete Removal/Crush/Place (PCBs >1.0 mg/kg but <3.5 mg/kg) ⁷	26,220	ft ³	\$ 3	\$ 78,660
10	Concrete Removal/Size/Load (PCBs >3.5 mg/kg but <50 mg/kg)	7,080	ft ³	\$ 4	\$ 28,320
11	Concrete Removal/Size/Load	2,020	ft ³	\$ 4	\$ 8,080
12	Stockpile and Confirmation Sampling	35	ea	\$ 250	\$ 8,830
13	Transport and Dispose (PCBs >3.5 mg/kg, but <50 mg/kg)	900	ton	\$ 115	\$ 103,500
14	Transport and Dispose (PCBs >50 mg/kg)	120	ton	\$ 295	\$ 35,400
15	Interim Cap	1	ls	\$ 20,000	\$ 20,000
VOCs SVE					
16	Site Preparation	1	ls	\$ 5,000	\$ 5,000
17	SVE Well and Probe Installation	23	ea	\$ 6,000	\$ 138,000
18	Well Head Completion, Valves, Surface Seal	23	ea	\$ 1,000	\$ 23,000
19	Treatment System Manifold, Valves, Controls	1	ls	\$ 6,000	\$ 6,000
20	Auto-Dialer Control and Instrumentation	1	ls	\$ 5,000	\$ 5,000
21	Vapor-Phase GAC Vessels	1	ls	\$ 18,000	\$ 18,000
22	Electrical Panel/Supply	1	ls	\$ 15,000	\$ 15,000
23	Temporary Hose and Piping	2,000	lf	\$ 10	\$ 20,000
24	Compound Gravel Pad, Fence Installation, Gates	1	ea	\$ 8,000	\$ 8,000
25	Treatment System Installation and Start-Up	1	ls	\$ 20,000	\$ 20,000
26	Laboratory Analysis	1	ls	\$ 10,000	\$ 10,000
27	Health and Safety	1	ls	\$ 10,000	\$ 10,000
28	System Decommission	1	ls	\$ 25,000	\$ 25,000
29	Other Non-Scheduled Contract Work	1	ls	\$ 10,000	\$ 10,000
Direct Capital Total					\$ 8,329,000
Indirect Capital Costs					
1	Permitting AQMD	5%	of	\$ 8,329,000	\$ 416,450
2	System Design	10%	of	\$ 8,329,000	\$ 832,900
3	Construction Management	6%	of	\$ 8,329,000	\$ 499,740
Indirect Capital Subtotal					\$ 1,749,000
Direct + Indirect Cost					\$ 10,078,000
Bid Contingency (15% estimated contractor costs)					\$ 1,512,000
Scope Contingency (15% estimated contractor costs)					\$ 1,512,000
Contingencies					\$ 3,024,000
Capital Total					\$ 13,102,000

TABLE A-3

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ALTERNATIVE #4
IN SITU STABILIZATION OF SHALLOW PCB/METALS-IMPACTED SOIL AND DEEP STODDARD SOLVENT-IMPACTED SOIL
SVE FOR SHALLOW AND DEEP VOC-IMPACTED SOIL
DEMOLITION AND DISPOISAL OF PCB-IMPACTED CONCRETE
Former Pechiney Cast Plate, Inc., Facility
Vernon, California

Item No.	Description	Estimated	Unit	Unit Cost	Estimated Cost
Annual Operation and Maintenance					
1	Equipment Rental	12	mths	\$ 5,000	\$ 60,000
2	Operations & Maintenance	12	mths	\$ 8,000	\$ 96,000
3	Carbon Changeouts	16	ea	\$ 3,000	\$ 48,000
4	Electrical Fees	12	mths	\$ 2,000	\$ 24,000
5	Sampling & Analysis	12	mths	\$ 2,000	\$ 24,000
6	Production Water Disposal	12	mths	\$ 4,000	\$ 48,000
7	Project Management/Consultant Support/Reports	12	mths	\$ 4,000	\$ 48,000
8	Health & Safety/Air Monitoring	12	mths	\$ 1,000	\$ 12,000
9	Miscellaneous	12	mths	\$ 2,000	\$ 24,000
10	DTSC Quarterly Status Report	4	ea	\$ 10,000	\$ 40,000
Annual Operation and Maintenance Subtotal					\$ 424,000
Present Worth Factor (5%, 3 years)					2.72
Present Worth of Operation and Maintenance					\$ 1,155,000
TOTAL CONSTRUCTION PLUS O&M FOR 3 YEARS					\$ 14,300,000

Notes/Assumptions:

1. Mobilization includes Crawler-mounted large diameter augers.
2. Assume ~10 percent cement additive. Actual mix design would be performed during Design with necessary cement percentage based on leachability.
3. Stockpile confirmation sampling rate at one sample per 200 cubic yards.
4. Stabilization rate of 300 cubic yards per day.
5. PCB-Impacted Concrete includes removal and disposal of all concrete impacted with PCBs greater than 1.0 mg/kg. Demolition and removal costs associated with foundations, footings, pits, sumps, and other subsurface structures are excluded.
6. Concrete Removal/Crush/Place (PCBs >1.0 mg/kg, but <3.5 mg/kg) includes crushing, placement, and compaction.
7. No cost included for institutional controls such as deed restrictions which will include legal and administrative fees.
8. No cost included for engineering controls such as future vapor barrier requirements.
9. Cost assumes 20 percent of mixed volume requires off-site disposal.
10. Assume 1,000 SCFM minimum for SVE system.
11. Total system operation for a period of one year; for purposes of cost estimation, assumes system run time of three years.
12. SVE = Soil Vapor Extraction.
13. Dual 1,000 pound vapor phase granular activated carbon (GAC) vessels for SVE system.
14. AQMD = Southern California Air Quality Management District.
15. Soil Conversion Factor: 1.5 tons/cy.
16. Concrete Slab removal is based on an average concrete slab thickness of 12 inches.
17. Density of Concrete is 150 lbs/ft³.
18. No cost included for institutional controls such as deed restrictions which will include legal and administrative fees.
19. No cost included for engineering controls such as future vapor barrier requirements.
20. Bid and Scope contingencies derived from "A Guide to Developing and Documenting Remedial Alternative Cost Estimates During the FS," EPA, 2000.
21. ls = lump sum price.
22. cy = cubic yard.
23. ea = each.
24. lf = linear feet.
25. mths = months.
26. ft³ = cubic feet.